

Supporting Document B  
Variables, Rates, and Formulae for Calculating Response  
Rates and Reporting Requirements: Economic Surveys and  
Censuses

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*Census Bureau Standard*  
[Response Rate Definitions](#)

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## Document Management & Control <sup>1</sup>

Version	Issue Date	Approval	Description
1.0	05 July 05	Associate Directors	Initial Release
1.1	09 Mar 06	Configuration Mgr.	Inserted hyperlink for main standard.
1.2	28 Mar 06	Configuration Mgr.	Reformatted Section 3.
1.3	01 Aug 06	Quality Prog. Mgr	Clarified the intent of reporting requirement 4

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<sup>1</sup> **The most current version of this document is maintained on the Census Bureau Intranet and may be accessed from the Quality Management Repository.**

## Variables, Rates, and Formulae for Calculating Response Rates and Reporting Requirements: Economic Surveys and Censuses

### 1. Variables

The variables needed to calculate economic survey and census response rates are partitioned into four groups. The first set of variables describes eligibility status. These variables distinguish between units<sup>2</sup> that are known to be eligible for data collection, known to be ineligible for data collection, to have an unknown eligibility for data collection, or have their data obtained from qualified administrative sources or a validated model. The data collection target population guides the distinction between eligible and ineligible units. The second set describes the response status for eligible units. The third set of variables are required for the computation of universe level response rates. The fourth set of variables provide detail on the nonresponse universe by identifying the type of (or the reason for) the nonresponse.

#### *1.1 Eligibility Status Variables*

Four variables - E, I, U, and A describe the eligibility status of the universe. All reporting units are classified as eligible for data collection (E), ineligible for data collection (I), of unknown eligibility for data collection (U), or have their data obtained from qualified administrative sources or a validated model (A). The target population refers to units upon which influences (estimates) are made. Units may be considered eligible in one survey or census but ineligible for another, depending upon the target population. For example, a unit that was in business before October 2004 is eligible for the 2004 Annual Trade Survey, but is ineligible for the October Monthly Retail Trade Survey.

<i>Variable</i>	<b>E</b>
<i>Definition</i>	The number of units eligible for data collection. This is the number of units for which an attempt has been made to collect data and it is known that the unit belongs to the target population. Eligible units include units that provide sufficient information to be considered a response as well as units that do not provide sufficient information to be considered a response.
<i>Computation</i>	Sum of all eligible units.

<i>Variable</i>	<b>I</b>
<i>Definition</i>	The number of units which are ineligible for data collection. This is the number of units for which an attempt is made to collect data and it is confirmed that the unit is not a member of the target population. Confirmation information may come from observation, from a respondent or from another source. Some examples of ineligible units include: firms that went out of business prior to the

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<sup>2</sup> 'Unit' means 'reporting unit' in this attachment.

survey reference period and firms in an industry that is out-of-scope for the survey in question.

*Computation* Sum of all ineligible units.

*Variable* **U**

*Definition* The number of units for which eligibility for data collection could not be determined. This occurs if there is an attempt to collect data from a unit, and this attempt is not successful and there is no information available about whether or not the unit is a member of the target population. Units whose forms are not deliverable as addressed have unknown eligibility.

*Computation* Sum of all units with an unknown eligibility.

*Variable* **A**

*Definition* The number of units belonging to the target population for which it was decided to not collect survey data, but instead to obtain administrative data<sup>3</sup> from sources determined to be of equivalent quality as data provided by respondents or to impute data from data based on a validated model. The decision to not collect survey data must have been made for survey efficiency only and for reasons other than that a unit had been a refusal in the past.

*Computation* Sum of all units belonging to the target population for which it was decided not to collect survey data, but instead to obtain administrative data for reasons given in the definition above.

## ***1.2 Response Status Variable***

Response status is determined only for the eligible units. The definition of sufficient data will vary across surveys and will impact the count of responding units.

*Variable* **R**

*Definition* The number of eligible units for which an attempt was made to collect data, the unit belongs to the target population, and the unit provided sufficient data to be classified as a response. In a multi-mode survey or census, responses could be obtained by mail, internet, telephone, fax, or touch-tone data entry/voice recognition.

*Computation* Sum of all responding units across data collection modes.

## ***1.3 Other Universe Level Response Variables***

*Variable*  **$w_i$**

*Definition* The sampling weight for the  $i$ th unit.

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<sup>3</sup> Here, administrative data means data that are collected for other than statistical purposes, such as data needed to manage programs in a non-statistical agency.

*Variable*       **$t_i$**   
*Definition*    The quantity of a key variable for the  $i$ th unit.

*Variable*      **T**  
*Definition*    The estimated (weighted) total of the variable  $t$  over the entire population represented by the frame. T is based on actual data (and administrative data for some surveys) and on imputed data or nonresponse adjustment.

#### ***1.4 Detailed Reasons for Nonresponse Variables***

To improve interpretation of the response rate and better manage resources, it is recommended that whenever possible, detailed reasons for (or types of) nonresponse be measured. Five specific variables describing nonresponse reasons are defined below. The first three variables (REF, HREF, and INSF) define nonresponse reasons for eligible units. The final two variables (UAA and OTHU) define the reasons for units with unknown eligibility.

*Variable*      **REF**  
*Definition*    The number of eligible units that did not respond due to respondent refusal.  
*Computation* Sum of all units with a final outcome of “refusal.”

*Variable*      **HREF**  
*Definition*    The number of “hard refusals.” These are eligible units that informed the Census Bureau they would not participate. These are a subset of the REF units.  
*Computation* Sum of all units with a final outcome of “hard refusal.”

*Variable*      **INSF**  
*Definition*    The number of eligible units that participated but did not provide sufficient data to qualify as a response.  
*Computation* Sum of all units with a final outcome of “insufficient data.”

*Variable*      **UAA**  
*Definition*    The number of units whose survey forms are “undeliverable as addressed.” These units are of unknown eligibility.  
*Computation* Sum of all units with a final outcome of “undeliverable as addressed.”

*Variable*      **OTHU**  
*Definition*    The number of units that did not respond for a reason other than refusal, insufficient data, or undeliverable as addressed. These units are units of unknown eligibility, but are not UAAs.  
*Computation* Sum of all units with a final outcome of “other nonresponse.”

## 2. Rates and Formulae

### 2.1 Primary Rates

*Rate* Response Rate

*Definition* The rate of responding units to the sum of eligible units and units of unknown eligibility.

*Computation*  $[R/(E+U)] * 100$

*Rate* Quantity Response Rate

*Definition* The rate of total weighted quantity for responding units to the total estimated quantity for all units eligible for tabulation.

*Computation*  $\left[ \sum_{i=1}^R w_i t_i / T \right] * 100$

*Rate* Total Quantity Response Rate

*Definition* The rate of total weighted quantity of data from responding units and from sources determined to be of equivalent quality as data provided by respondents to the total estimated quantity for all units eligible for tabulation.

*Computation*  $\left[ \sum_{i=1}^{R+A} w_i t_i / T \right] * 100$

### 2.2 Detailed Rates

*Rate* Refusal Rate

*Definition* The rate of units classified as “refusal” to the sum of eligible units and units of unknown eligibility.

*Computation*  $[REF/(E+U)] * 100$

*Rate* Hard Refusal Rate

*Definition* The rate of units classified as “hard refusals” to the sum of eligible units and units of unknown eligibility.

*Computation*  $[HREF/(E+U)] * 100$

*Rate* Insufficient Data Rate

*Definition* The rate of units classified as “insufficient data” to the sum of eligible units and units of unknown eligibility.

*Computation*  $[INSF/(E+U)] * 100$

<i>Rate</i>	Undeliverable as Addressed Rate
<i>Definition</i>	The rate of units classified as “undeliverable as addressed” to the sum of eligible units and units of unknown eligibility.
<i>Computation</i>	$[UAA/(E+U)] * 100$
<i>Rate</i>	Other Reason for Nonresponse Rate
<i>Definition</i>	The rate of units classified as “other reason for nonresponse” to the sum of eligible units and units of unknown eligibility.
<i>Computation</i>	$[OTHU/(E+U)] * 100$
<i>Rate</i>	Unknown Eligibility Rate
<i>Definition</i>	The rate of units not classified as “unknown eligibility” to the sum of eligible units and units of unknown eligibility.
<i>Computation</i>	$[U/(E+U)] * 100$

### 3. Reporting Requirements

**Reporting Requirement 1:** *When a response rate is reported, the universe of inference or target population for that survey or census must also be described.*

To report the universe of inference or target population, the documentation should indicate which units are included and which are excluded from the target population. For example, the Monthly Wholesale Trade Survey includes companies with employment that are primarily engaged in merchant wholesale trades in the U.S. These include merchant wholesalers that take title of the goods they sell, and jobbers, industrial distributors, exporters, and importers. Excluded are non-merchant wholesalers such as manufacturer sales branches and offices; agents, merchandise or commodity brokers, and commission merchants; and other businesses whose primary activity is other than wholesale trade.

**Reporting Requirement 2:** *When a response rate is reported, it must be noted whether the rate is an unweighted response rate, a quantity response rate, or a total quantity response rate.*

When establishment surveys and censuses report quantity or total quantity response rates, the measure of size (i.e., quantity of a key variable) used in computing the response rate must be stated. For example, the measure of size in the Monthly Retail Sales survey may be the total retail sales of an establishment.

**Reporting Requirement 3:** *When using any of the three response rates, surveys or censuses must report the definition of responding units. When using Total Quantity Response Rates, surveys or censuses must also report nonresponse data sources.*

Many surveys or censuses allow some leeway when defining responding units. Each survey or census should establish a definition of a responding eligible unit prior to implementing the definition. Units are determined to be responding based on whether key characteristics are reported. For example, when calculating the Total Quantity Response Rate, annual payroll, first quarter payroll, or employment must be reported or obtained from administrative records.

**Reporting Requirement 4:** *When available, rates should be calculated using the edited data at the time of each estimate's release phase. The response rate for the final release should use the final, edited data. When the appropriate edited data are not used, note this.*

When possible, the outcomes used to calculate response rates should reflect outcomes after the data has undergone any edits or other post-data collection processing. When the Census Bureau conducts surveys for other agencies, the sponsoring agency will be the source for the nonresponse rates.

**Example: Reporting a response rate in an economic survey.**

The dollar volume response (i.e., quantity response rate) to the Annual Wholesale Trade Survey is 89 percent for total sales and 87 percent for total inventories (*reporting requirement 2*). The survey population consists of companies with employment that are primarily engaged in merchant wholesale trades in the U.S. (*reporting requirement 1*) These include merchant wholesalers that take title of the goods they sell, and jobbers, industrial distributors, exporters, and importers. Excluded are non-merchant wholesalers such as manufacturer sales branches and offices; agents, merchandise or commodity brokers, and commission merchants; and other businesses whose primary activity is other than wholesale trade. To be eligible for tabulation, units selected into the sample with probability less than one must be on the latest available IRS mailing list for FICA taxpayers from the most recent available quarter. Units selected with probability one are eligible as long as there is no evidence that they were not out of business for the entire reference year(s) covered by the survey (*reporting requirement 3*).